

First records of the black bullhead, *Ameiurus melas* in the Czech Republic freshwaters

by

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RÉSUMÉ. - Premier signalement de poisson-chat nord-américain, *Ameiurus melas* en République tchèque.

Les spécimens ont été capturés dans une zone inondée par la rivière Lužnice. Il semblerait que ceux-ci se soient échappés d'un étang à proximité d'une ferme aquacole. Toutefois, l'origine de la population d'*Ameiurus melas* (Rafinesque, 1820) dans l'Elbe, où *Ameiurus nebulosus* (Lesueur, 1819) a été historiquement répertorié, n'est toujours pas connue. La présence d'*Ameiurus melas*, spécialement dans les zones humides, pourrait présenter un danger pour la conservation des espèces autochtones. Ces nouveaux signalements nous alertent donc sur la dispersion constante de cette espèce à travers le continent européen.

Key words. - Ictaluridae - *Ameiurus melas* - Czech Republic - Introduction - Invasive species - Environmental impacts - First records.

The black bullhead *Ameiurus melas* (Rafinesque, 1820), a catfish originally from North America, is a successful non-native invader, which established numerous populations throughout Europe (past records reviewed by Wheeler, 1978; Elvira, 1984; Gante and Santos, 2002). In the 19th century, many introductions of ictalurid catfishes mostly aimed for laboratory use and/or as pet fish, have occurred. Inevitably, by the end of the 19th c., American catfishes were found in many European waters. Most catfishes were believed to be *Ameiurus nebulosus* (Lesueur, 1819), but some authors have identified several species of ictalurids (Wheeler, 1978). Based on these results and additional critical determination of other specimens, Wheeler (1978) stated that *A. melas* was the most widespread ictalurid catfish in Europe. Recently, its occurrence has been reported also from neighbouring countries, such as occasional findings in a pond close to Berlin, Germany (Doering and Ludwig, 1992), and from eastern Slovakia (Koščo and Košuth, 2002). Therefore, the occurrence of this alien fish in the Czech Republic was highly expected.

MATERIAL AND METHODS

There are no previous Czech reports of *Ameiurus melas* in the wild, with the only unpublished records being probably specimens of *A. melas* occasionally found in pond aquaculture units in South Bohemia. In April 2007, however, four catfish specimens of total length (L_t) 125.3 to 130.5 mm and mass (M) 23.6 to 24.8 g ($L_t = 128.5 \pm 2.8$ mm; $M = 24.3 \pm 0.6$ g; mean \pm SD) were captured during electrofishing survey in floodplain area of the Lužnice River (48°57'32.4"N; 14°51'51.4"E; South Bohemia; Fig. 1). Moreover,

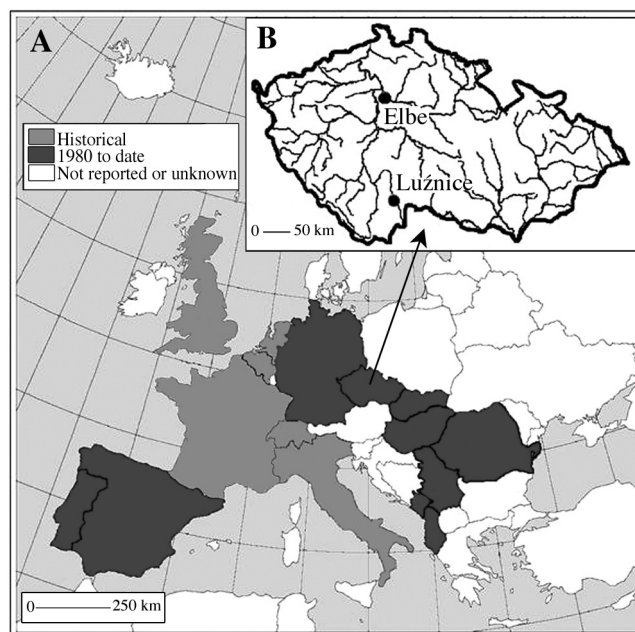


Figure 1. - Location map showing the first records (●) of *Ameiurus melas* in the Czech Republic. [Carte représentant les nouveaux signalements (●) d'*A. melas* en République tchèque].

fourteen specimens (L_t range: 92.3 to 272.0 mm, $L_t = 214.5 \pm 56.4$ mm; M range: 11.2 to 298.0 g, $M = 156.3 \pm 84.4$ g; mean \pm SD) were collected during the subsequent fishing expedition aimed for reference catfish collection in the Elbe River (50°20'3.8"N; 14°29'40.7"E; Central Bohemia; Fig. 1) where the presence of *A. nebulosus* was previously reported (e.g. Holčík, 1972). In both sampling occasions, fish were removed and transferred to an experimental facility for species identification. All the specimens were deposited in the fish collection (No. CZAM01-18) of the RIFCH, University of South Bohemia.

RESULTS

Following the morphological distinctions between *Ameiurus melas* and *A. nebulosus* (Scott and Crossman, 1973; Kazyak and Raesby, 2003), then particularly number of anal fin rays (Tab. I), pattern of barb distribution in pectoral fin (barbs on the posterior

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Table I. - Meristic characters (number of fin rays, form of caudal fin) of *Ameiurus melas* specimens collected from the Lužnice (n = 4) and Elbe (n = 14) rivers with reference to the typical meristic characters of Ictalurid catfishes (data from Scott and Crossman, 1973; Kazyak and Raesby, 2003). D: dorsal fin rays; P: pectoral fin rays; V: ventral fin rays; A: anal fin rays; C: caudal fin rays. [Caractères méristiques (nombre de rayons des nageoires, forme de la nageoire caudale) des spécimens d'*A. melas* collectés dans les rivières de Lužnice (4 spécimens) et Elbe (14 spécimens), avec les références des caractères méristiques des poissons de la famille des Ictaluridae. D : nageoires dorsales ; P : nageoires pectorales ; V : nageoires pelviennes ; A : nageoires anales ; C : nageoires caudales.]

	D	P	V	A	C
Lužnice River	I, 6	I, 9	8	20 ± 0.6 (20-21)	18 rounded
Elbe River	I, 7	I, 9 ± 0.5 (8-9)	8	20 ± 1.0 (18-21)	16 ± 0.7 (15-17), rounded
<i>Ameiurus melas</i>	I, 5-6	I, 8	8	17-21	15-18, rounded
<i>Ameiurus nebulosus</i>	I, 6-7	I, 8	8	21-24	18-19, rounded

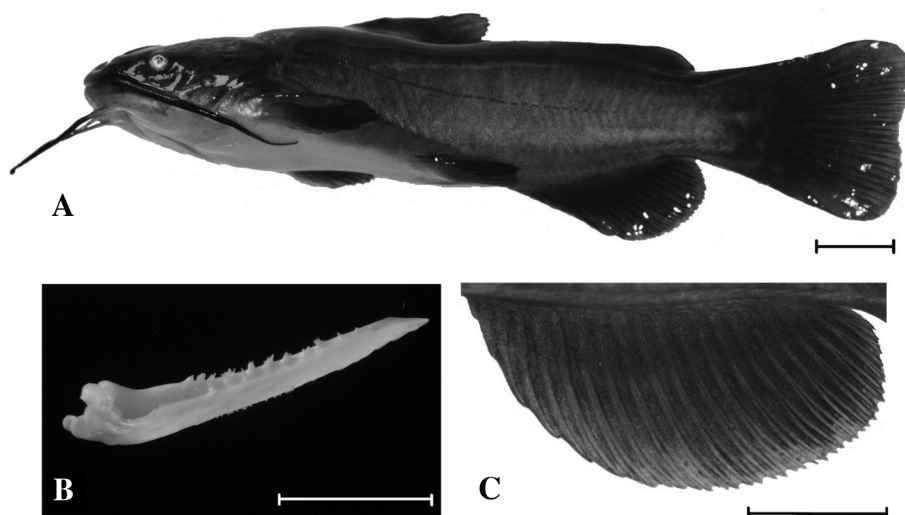


Figure 2. - *Ameiurus melas*, specimen captured in the Elbe River. A: Left lateral view; B: First ray (hard spine) of the pectoral fin with barbs; C: Anal fin in detail (strong pigmented and noticeably dusky inter-ray membrane). Scale bars = 10 mm. [*A. melas*, spécimen capturé dans la rivière Elbe. A : Vue latérale gauche ; B : Premier rayon épineux de la nageoire pectorale ; C : Détail de la nageoire anale.]

edge of pectoral spines of the first ray [hard spine] was found weak, especially near the tip and absent near base), inter-ray membranes of dorsal, caudal, anal and ventral fins strongly pigmented and noticeably dusky (Fig. 2), all the collected specimens either from Lužnice or Elbe rivers were identified as *Ameiurus melas* (Tab. I).

DISCUSSION

Presented results based on the morphological characters herein confirm the occurrence of *A. melas* for the first time in the Czech republic freshwaters. In terms of *A. melas* origin (in case of the Czech Republic), the most probable explanation for its finding in the Lužnice River floodplain might be natural spread of individuals from pond aquaculture, via e.g. pond connecting canals. Thus, it seems likely that *A. melas* was accidentally imported amongst carp (*Cyprinus carpio* L.) or tench (*Tinca tinca* L.) from countries where it already widely occurs, such as Hungary or Romania (Wilhelm, 1998).

Unfortunately, neither natural spread nor fish escapees from

pond aquaculture can clearly explain its presence in the Elbe River, due to hydrological disconnection (the presence of the Vltava reservoir cascade). Based on our fishing surveys, *A. melas* was the only ictalurid species recorded in this river as present, although references exist to historical introductions and identification of *A. nebulosus* (e.g. Holčík, 1972). Therefore, the occurrence of *A. nebulosus* should be revised, probably not only in the Elbe River. Moreover, observed differences in meristic characters between specimens from Lužnice and Elbe rivers seem to distinguish the catfish origin. This is later supported by the fact that only juvenile specimens of *A. melas* were captured in the Lužnice River (potential escapees). However, specimens of Elbe River origin were recorded as juveniles and adults, and noticeably show that *A. melas* already established self-sustaining population.

Ameiurus melas is a well-adapted species for widespread dispersal and rapid colonization of new areas. Not surprisingly, therefore, it has been successfully expanded outside its native range and it is classified as a species causing biological disequilibrium (e.g. Cucherousset *et al.*, 2006; Kottelat and Freyhof, 2007). Although *A. melas* has not been reported in the wild from other Czech localities or other central European countries, it is important to verify and document the spread of this invasive species, since it might have spread undetected or misidentified. Therefore, higher effort must be paid to either the faunistic monitoring such as an important tool to prevent the pathways of introduction and dispersal of non-native species, and studies of interactions between the alien and native fish fauna to estimate and reduce potential impacts.

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REFERENCES

- CUCHEROUSSET J., PAILLISSON J.M., CARPENTIER A., EYBERT M.C. & J.D. OLDEN, 2006. - Habitat use of an artificial wetland by the invasive catfish *Ameiurus melas*. *Ecol. Freshw. Fish.*, 15: 589-596.
- DOERING P. & J. LUDWIG, 1992. - Nachweis des Schwarzen Zwergwelses *Ictalurus melas* (Rafinesque), in einem Teich in Berlin. *Rana*, 6: 168-169.

- ELVIRA B., 1984. - First records of the North American catfish *Ictalurus melas* (Rafinesque, 1820) (Pisces, Ictaluridae) in Spanish waters. *Cybium*, 8: 96-98.
- GANTE H.F. & C.D. SANTOS, 2002. - First records of the North American catfish *Ameiurus melas* in Portugal. *J. Fish. Biol.*, 61: 1643-1646.
- HOLČÍK J., 1972. - The systematic status of bullhead (*Ictalurus melas* Rafinesque, 1820) (Osteichthyes: Ictaluridae) in Czechoslovakia. *Vestn. Česk. Spol. Zool.*, 36(3): 187-191.
- KAZYAK P.F. & R.L. RAESBY, 2003. - Key to the Freshwater Fishes of Maryland. Available at http://www.dnr.state.md.us/streams/pubs/fishkey_2003.pdf.
- KOŠČO J. & P. KOŠUTH, 2002. - On the occurrence of *Ictalurus melas* Rafinesque, 1820 and *Percottus glenii* Dybowski, 1877 from East Slovakia. *Biodiv. Fish. Czech Repub.*, 4: 105-108.
- KOTTELAT M. & J. FREYHOF, 2007. - Handbook of European Freshwater Fishes. 646 p. Cornol (Switzerland): Publications Kottelat.
- SCOTT W.B. & E.J. CROSSMAN, 1973. - Freshwater fishes of Canada. *Bull. Fish. Res. Bd Can.*, 184: 1-966.
- WHEELER A., 1978. - *Ictalurus melas* (Rafinesque, 1820) and *I. nebulosus* (Lesueur, 1819): The North American catfishes in Europe. *J. Fish Biol.*, 12: 435-439.
- WILHELM A., 1998. - Black bullhead (*Ictalurus melas* Rafinesque, 1820) (Pisces: Ostariophysi: Bagroidae), a new species of fish recently found in Romanian waters. *Trav. Mus. Hist. Nat. "Grigore Antipa"*, 40: 377-381.

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